A.2.6 SWMU 6

Description

SWMU 6 was identified based on the indicated presence of TEL burials on the Refinery Leaded Burial Map. As depicted on Figure A.2.4, SWMU 6 consists of a suspected 20-foot by 20-foot TEL sludge burial located in the northwest corner of Tank Basin 306 in the North Field.

As shown on Figure A.2.4 and summarized on Table A.2.4, 11 borings, 12 soil samples, one monitoring well groundwater sample and one hydropunch sample have been used to characterize SWMU 6. In addition, relevant data from SWMU 17 and area NF5 (2nd-Phase OWSS) are also shown on Table A.2.4 for delineation purposes.

A total of seven borings were installed during the 1st-Phase RFI, and one soil sample was analyzed for Skinner's List VOCs and SVOCs, lead and TOL. One hydropunch groundwater sample was also collected and analyzed for Skinner's List VOCs and SVOCs, and lead. During the full RFI, 11 soil samples were collected from four borings to further characterize SWMU 6. Of these, nine samples were analyzed for TCL VOCs and SVOCs; two samples were analyzed for BTEX and phenols; nine samples were analyzed for PAHs; one sample was analyzed for TAL metals; 10 samples were analyzed for lead; and 11 samples were analyzed for TOL. One sample was analyzed for physical characteristics[1] and one sample was analyzed for SPLP lead.

Soils

The soil sample from SB0034 obtained during the 1st-Phase RFI was collected from four to six feet bgs and contained TEL (33.3 mg/kg), lead (8,340 mg/kg), benzene (4.6 mg/kg), benzo(a)pyrene (0.96 mg//kg) and several other SVOCs above the applicable soil delineation criteria. The other borings exhibited some indication of staining between zero to eight feet bgs, and the headspace readings ranged from 1 ppm at U006002 to 139 ppm at U006003. Therefore, Chevron determined that additional source characterization was warranted to evaluate the location and extent of this TEL site. As discussed above, additional source characterization was conducted in August 2002 and January 2003 to delineate the horizontal and vertical extent of this TEL site.

The following table summarizes the number of samples where soil delineation criteria were exceeded within SWMU 6:

[1]Physical characteristics specified in Appendix A, Task IV of Module III of the HWSA Permit included saturated and unsaturated permeability tests, moisture content, relative permeability, bulk density, porosity, soil sorptive capacity, CEC, TOC, pH, Eh and grain size distribution.

Constituents of Concern	Surface Soils (0 to 2 ft) (4 Samples)	Fill Material (>2 ft) (5 Samples)	Native Soils (3 Samples)	Totals (12 Samples)
Benzene	0/4	1/5	2/3	3/12
Benzo(a)pyrene	0/3	1/4	0/3	1/10
Other SVOCs	0/4	1/5	0/3	1/12
Lead	0/4	1/5	0/3	1/12
TOL/TEL	1/4	1/5	0/3	2/12

Surface Soils (0 to 2 feet bgs)

Some staining and other evidence of petroleum-related impacts were noted in surface soils in the vicinity of SWMU 6; however, there were no exceedances of the soil delineation criteria in any of the four surficial samples, except for the presence of TOL (2.9 mg/kg) in one soil sample (S1021A4).

Fill Materials (>2 feet bgs)

Several borings exhibited visual/olfactory evidence of petroleum-related impacts, as well as the presence of catalyst beads from six to 10 feet bgs at S1021. The fill material ranges in thickness from approximately five to 10 feet at SWMU 6. Soil delineation criteria were exceeded in only one of the soil samples collected from the fill unit (SB0034SC). The sample from this boring contained benzene (4.6 mg/kg) benzo(a)pyrene (0.96 mg/kg), benzo(a)anthracene (0.95 mg/kg), lead (8340 mg/kg) and TEL (33.3 mg/kg) above their respective soil delineation criteria. Although benzene was detected in two other samples: S0772C3 (1.1 mg/kg, 5 to 5.5 feet bgs) and S0773C4 (1.08 mg/kg, 5.5 to 6 feet bgs), both of these samples were collected below the water table so the IGWSCC (1 mg/kg) is not applicable, and both concentrations are below the RDCSCC (3 mg/kg).

Native Soils

A peat (meadow mat) layer underlies the fill material at depths ranging from five to 10 feet bgs. Some staining was noted in the underlying peat at several locations. Benzene (8.3 and 23 mg/kg) was detected in excess of the delineation criterion within two of the native peat samples (S0771F1 and S0772E2, respectively). Benzene was not detected in surface or fill soil samples above the peat at either of these locations. As this area is directly downgradient of LNAPL areas NF5 and AOC8/NF6, it is possible that these LNAPL areas are the source of benzene at these borings.

As discussed further in Section 6 of the RFI Report, lateral delineation of selected COCs has been completed on a site-wide basis for each Yard. The delineation of these COCs is depicted graphically on the figures provided in Section 6.

Groundwater

Soil boring S0773 was completed as monitoring well MW-118 and a sample collected during November 2002 contained benzene (15 µg/L), cyclohexane (180 µg/L), and arsenic (9.8 µg/L) at concentrations in excess of their applicable delineation criteria. It does not appear that this TEL burial is impacting groundwater, given that lead was not detected above the groundwater delineation criterion at MW-118. The organic constituents that were detected at MW118 may be attributed to the LNAPL areas (NF5 and AOC8-NF6) that are located upgradient of this SWMU. Furthermore, benzene concentrations appear to be decreasing in this area, based on a comparison of the 2002 groundwater data to the 1997 groundwater data in this area. Further discussion of groundwater impacts can be found in Section 8 of the RFI Report.

Summary

In summary, SWMU 6 is a confirmed TEL burial site based on the presence of lead and TEL in one sample above applicable soil delineation criteria from SWMU 6. Benzo(a)pyrene and several other SVOCs were also detected in one of the samples, and benzene was detected in several samples collected from both fill and native soil within the saturated zone. This SWMU has been adequately delineated. Benzene, cyclohexane and arsenic were detected in excess of the groundwater delineation criteria in the monitoring well (MW-118) at this SWMU. This SWMU will be included for further evaluation in both the soil and site-wide groundwater portions of the CMS.